of the joint. The design manual also discusses the cases where joints shall be armored. For projects with a design average daily truck traffic (ADTT) of 2500 or more, and all bridges on the national highway system (NHS) regardless of ADTT, the Evazote joint seal shall be armored from gutter line to gutter line. (North Carolina Department of Transportation, 2007). Figure 1-1 shows a cut-section view of a typical expansion joint with elastomeric concrete serving as the nosing material within the concrete blockout. The left side displays an unarmored joint and the right side displays an armored joint, both incorporating the typical Evazote neoprene seal.

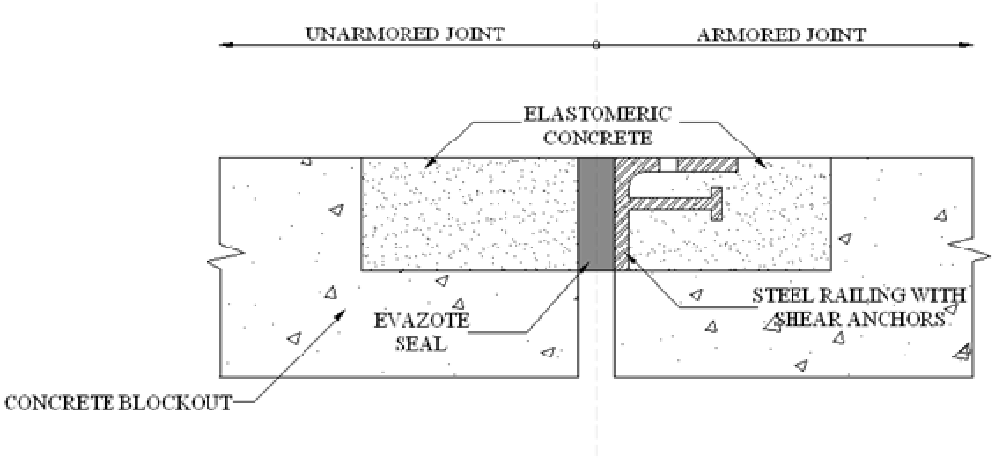

Figure 1-1. Half plan of a typical armored and unarmored expansion joints

1.3 Product Performance

It has proven effective as a nosing material when used in conjunction with unarmored and armored expansion joints, which can be attributed to a number of factors. First, it has very good bond strength characteristics to both steel and concrete.

When considering expansion joint headers, another key factor is resilience. The resilience of elastomeric concrete allows for expansion, contraction, and load dissipation to occur without considerable spalling taking place. Spalling can be defined as deterioration over time that can lead to fragments of a material becoming loose. Spalling of the nosing material not only takes away from the aesthetics of the bridge, but also creates cracks and voids, which can house water and other foreign objects.

Water can ultimately degrade the nosing material especially in regions which are subject to harsh freeze-thaw cycles. Similarly, deicing salts can penetrate the spalled areas of the nosing material, and can ultimately leak down to the substructure, prematurely degrading many of the substructure components. Prior to elastomeric concrete, Portland cement concrete served as the header material. The brittle properties of this concrete led to significant levels of spalling, proving that normal concrete was an undesirable header material. Previous research indicates that poorly consolidated Portland cement concrete produces low strength concrete possessing air pockets in which water can collect and freeze, ultimately resulting in spalling (Distlehorst & Wojakowski, 2005).

In September of 1994, MDOT technical personnel began a study of 10 polymer concrete materials (eight of which were elastomeric concrete) for use in the preventive maintenance of roadways and bridge decks.